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Parallel universes or Venn intersections? Numeracy and literacy teaching and learning

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Abstract

Over the years, there has been fierce debate about the definition of numeracy and literacy for Academic Language and Learning (ALL) practitioners and at times, we seem to work in parallel universes, but on reflection, we have more in common than is originally supposed. For students enrolled in mathematics courses in higher education, especially those in Education fac-ulties or schools, previous experience of studying mathematics does not al-ways equal competency with, and confidence in dealing with numeracy at tertiary level. McNaught and Hoyne (2011) argue that these concepts are co-dependent. Also, our diverse student population often struggles to achieve confidence and competency with academic language and literacy. This paper discusses our similar approach to teaching and learning where initially con-fidence is generated before challenges are issued and where explanation is privileged over discipline knowledge transference. Through our shared teaching in an ALL-focused program developed at our university, we are able to find common ground and greater understanding of each other's expertise.

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Parallel universes or Venn intersections?: Numeracy and literacy teaching and learning

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Over the years, there has been fierce debate about the definition of numeracy and literacy for Academic Language and Learning (ALL) practitioners and at times, we seem to work in parallel universes, but on reflection, we have more in common than is originally supposed. For students enrolled in mathematics courses in higher education, especially those in Education faculties or schools, previous experience of studying mathematics does not always equal competency with, and confidence in dealing with numeracy at tertiary level. McNaught and Hoyne (2011) argue that these concepts are co-dependent. Also, our diverse student population often struggles to achieve confidence and competency with academic language and literacy. This paper discusses our similar approach to teaching and learning where initially confidence is generated before challenges are issued and where explanation is privileged over discipline knowledge transference. Through our shared teaching in an ALL-focused program developed at our university, we are able to find common ground and greater understanding of each other's expertise.

Key Words: learning; literacy; numeracy; academic language; learning development

1. Introduction

As Academic Language and Learning (ALL) practitioners in a regional university in Australia, one working in the numeracy field and the other in the academic language field, it often seems that we work in what may be called parallel universes, with no common areas to link our practices. One predominantly uses individual consultations with students who may find Mathematics challenging and the other's practice mainly involves working with faculty academics to embed academic literacy into degree programs. Even when together in unit discussions that focus on administration issues relating to how we function, we have observed that there seems to be little overlap in our practices. Initially, we both lacked confidence when dealing with issues directly relating to each other's discipline although we had some knowledge of it; the boundary was further complicated by the professional respect we have for each other and for each other's roles.

This paper will focus on our approach to undergraduate students with whom we both deal whose degree programs include Education, Business, Humanities and Nursing. With diverse student populations which include domestic/international students, mature-age/school leavers, Indigenous students, students with disabilities, those with low socio-economic backgrounds, students on rural and remote campuses, or those who are 'first in family' to study at university, we find that we are both challenged with managing how to encourage confidence in our students so that they can develop into independent learners. Many who enrol in university are highly motivated but do not yet have the academic knowledge or experience required to decode the expectations of faculties and disciplines; some may have had negative previous educational experi-

ences relating to mathematics and/or writing. This makes it imperative that we consider how best to nurture these students and simultaneously develop their academic capacities without taking away their motivation to strive for learning and knowledge. Thus we have discovered that the overriding aim for both of us is the common theme of developing confidence in our students in spite of different spheres of expertise and therefore, on reflection, we argue that our work could be best represented by a Venn diagram[1] to demonstrate our commonalities and specificities.

An examination of external and internal regulatory documentation in higher education reveals that the Tertiary Education Quality and Standards Agency Act, 2011, (TEQSA), the Australian Qualifications Framework (AQF) and our university do not provide any specific definition of *literacy* or *numeracy*, although the AQF (2013, pp. 11 & 14) refers to them generically as "skills" which reduces them to acquisition rather than conduits for thinking and learning that allow development and application for communicating ideas. The AQF document terminology for *literacy* and *numeracy* is broadly expressed as "communication" at Level 7 (Bachelor degrees). Our university's Graduate Qualities Policy refers to these concepts also as "communication" and sets up the expectation that they will be developed by the time a student graduates (University of Wollongong, 2008). The TEQSA Higher Education Standards Framework (Threshold Standards) contains no mention of the terms *numeracy*, *mathematics*, or *literacy*; however there are several mentions of *English language*, which is why ALL educators turn to our professional body to clarify these terms. Many ALL practitioners are familiar with the pedagogical aims of *academic literacies* support which are defined in the Association for Academic Language and Learning's (AALL's) Position Statement (2010) as "assist[ing] students in developing appropriate academic language and learning expertise by collaborating with other higher and further education staff in the development of curricula so that they provide better learning opportunities for students' language and learning development". However, defining *numeracy* support is more problematic. AALL, and other academic associations, recognise that numeracy can be a difficult and complex area for students in higher education institutions, but the pressure on ALL numeracy practitioners for extra-curricular provision is now increasing, possibly but not only as a result of the range of students who enter university without the required background in mathematics for their course (MacGillivray, 2009, p. 461). AALL has therefore determined to adopt numeracy support provision specifically as part of its position statement.

This paper discusses the distinctions and similarities between the practices of academic language and numeracy support lecturers. Often each of these branches of academic knowledge is viewed on its own, with no overlap, as English and Mathematics are generally thought of as distinct disciplines with no common areas, and thus viewed in the metaphor of "parallel universes". On further inspection, however, although material and content in each area is divergent, nevertheless both are interdependent, particularly when students need to be supported in attaining the academic competence required for success in their higher education study. This interdependence can go undetected because we tend to work in silos and it is not until we discuss our practices together that valuable insight is gained. It will be pointed out in this paper that the similarities of our practices, such as our joint aim of developing student confidence, through methods which on occasion have been interpreted by some academic practitioners as oversimplifying students' knowledge acquisition, far outweigh the distinctions between our disciplines and thus we argue that our development of students' learning contains much common area, so that we use the preferred metaphor of an "intersecting Venn diagram" to describe them.

2. Literature review

Whilst there is much research about academic literacy and a growing body of literature about the importance of numeracy in higher education, there is a paucity of literature on how the practices of numeracy and literacy support overlaps or indeed occurs, which is the focus of this pa-

[1] For the purpose of this paper, a Venn diagram consists of two or more *intersecting* (rather than non-intersecting) circles.

per. Mathematical ability is often perceived to be a skill that bears little relationship to the real world. Taylor and Galligan's (2006) paper demonstrates that students often fail to understand that they have developed skills to a certain level prior to their university study – and these are imperative in order for them to navigate their way in the world. There is a parallel to this situation whereby academic language and literacy often suffers with a similar complaint, that is, language is also a tool through which we negotiate the world. We argue that there is a strong relationship between the broad fields of numeracy and academic language and literacy and in both spheres, students have achieved some threshold competencies prior to enrolling in university study, but it is necessary at the tertiary level to develop these competencies further to a level whereby they are more expert.

2.1. Definitions

Higher education institution governing bodies, such as TEQSA, either do not define *numeracy*, or may class it as a generic skill. Moreover, many Australian universities do not have a specific numeracy policy, preferring either to include *numeracy* under a broad language and literacy/ies policy, or else disregarding numeracy in their official standards documents. This may be because it is difficult to decide upon an appropriate definition. Some researchers propose an individual is numerate if s/he is able to judge confidently the type of mathematics to employ in a given situation, how accurate that mathematics should be, and, especially, whether results obtained by using that mathematics are meaningful in that particular context (Coben, 2000, cited in Marr & Hagston, 2007). Johnston (1994, cited in Tout, 2001) also sees numeracy firmly aligned with its applications, where different contexts require differing skills of mathematics. Taylor and Galligan (2009) define the term *academic numeracy* as a combination of mathematics obtained through the student's learning at school and that required for use in their discipline at university. They suggest it is "a critical awareness that allows students to become *confident* [italics added] and competent in using mathematics and to be able to situate, interpret, critique, use, communicate and even create mathematics within their discipline's setting" (p. 172).

However, numeracy is often seen as part of literacy (Townsend & Waterhouse, 2008). Whitin and Whitin (2008) advocate the recognition of "numeracy as an essential part of literacy" (p. 433) and distinguish only between types of texts – literary or mathematical – suggesting that both need to be critically analysed by their reader. Numeracy has also been interpreted as "the mathematical equivalent of literacy" (Perkins, 2009, p. 15) and thus "has its own share of perceptual problems". Perkins adds that, according to Marr and Hagston (2007), often numeracy is seen only as basic number skills and note that this is "an unfortunate misinterpretation" as it suggests numeracy sits on the lower levels of a learning continuum. Perkins also suggests, however, that often *numeracy* is included under the "umbrella term" of *language, literacy and numeracy* which can lead to "invisibility at policy level" (p. 14). This looseness in the definition of *numeracy* and how it connects with literacies in higher education therefore raises issues where *numeracy* is often overwhelmed, if not colonised, by the more dominating language and literacy field. The argument of the positioning of *numeracy* in higher education, although relevant, is not the focus of this paper; however, it can be seen from the literature that the definition of *numeracy* is contested and this does present difficulties for those who work to support students in this field.

2.2. The importance of confidence for students

It has been well documented that many people dislike mathematics, to the extent that it may even be considered acceptable, by Australians in general, not to like mathematics (Galligan, Wandel, Pigozzo, Frederiks, Robinson, Abdulla, & Dalby, 2013, p. 46). Indeed, some people exhibit various degrees of "mathematics anxiety" (Taylor & Galligan, 2006), regarding their ability with mathematics to be poor and having little confidence in using or applying mathematics. Others are less nervous but lack the confidence needed for them to succeed in finding a solution when faced with a mathematical problem. Many university students, therefore, are dismayed, or even alarmed, when they realise that they need to study mathematics as part of their undergraduate degree.

Although it seems to be generally recognised that confidence plays a large part in attaining numeracy competence (McNaught & Hoyne, 2011; Matthews, Hodgson, & Varsavsky, 2013), several researchers suggest that there may be different types of confidence paired with different aspects of mathematics learning. Pajares and Miller (1994) distinguish between confidence in mathematics overall and confidence in the ability to work through specific mathematics topics; Parsons, Croft, and Harrison (2009) add "applications confidence" and Warwick (2008) suggests that students base their judgements of their mathematics ability and confidence on the results of assessment tasks. It follows that many university students whose subjects have numeracy components in some form require development in mathematics and statistics and MacGillivray and Wilson (2008) note the benefits of this provision.

Both the authors of this paper deal with students who struggle to gain confidence with numeracy and/or language when they commence an undergraduate degree program. For these students, numeracy may seem, at times, over-awing and unattainable. Yet often there is a tendency among students who find mathematics or numeracy concepts "challenging" to be quite open about this fact whereas there can be a stigma attached to being a poor reader or communicator (Martini & Page, 1996, p. 121). However, when these students are faced with the imperative to succeed in numeracy-based subjects as part of their undergraduate degrees, it is important for them to realistically acknowledge their attitudes to mathematics – particularly those who are about to become teachers, because teachers, especially at the primary school level, who have little confidence in their own ability with mathematics are likely to pass this lack of confidence on to their own students (Bibby, 2002; Hodgen & Askew, 2007), thus potentially perpetuating the cycle of poor confidence in, and attitude towards mathematics.

In the language arena, there are continual judgements made about the low level of literacy among higher education students. In Australia, the Dawkins Report (1988) was pivotal in the massification of higher education. Students who enrol today have diverse backgrounds and enter university through varied pathways which can result in their being ill-equipped to navigate the university environment without explicit support. McKay and Devlin's (2014) research identifies the issues surrounding enrolling students from low socioeconomic backgrounds who may be unable to decode the universities' expectations. At the commencement of their studies, many students, regardless of their background, are overwhelmed by the magnitude of processes with which they have to deal, such as accessing timetables and interpreting subject outlines; using library facilities to access resources, both online and hardcopy; learning how to reference to avoid plagiarism, to name a few (Haggis, 2006). In this situation they can lose confidence in their ability to cope if there is no opportunity for support at the start of their study.

The literature indicates a factor that influences learning is the establishment of a safe learning environment (Kolb & Kolb, 2005). Tait (2004, p. 103) reported that by welcoming students and creating such an environment, it was acknowledged by many of the students surveyed that this increased their confidence at university. The study by Tumen, Shulruf, and Hattie (2008) revealed the implementation of academic support programs in students' first year increased their chances of successful completion. This was one of the concepts which underpinned the rationale of the case study, *Successful Transitions*, detailed below. Senior students whose personal experience could be articulated, the scaffolding of activities at a non-threatening level initially, and the use of humour to begin to develop learning relationships all contribute to the success of the program. Brinkworth, McCann, Matthews, and Nordström's (2008) study concurs with Coates' (2014) more recent study that first year programs are crucial for the academic success of students, especially as there has been an imperative to increase retention rates for Australian universities to remain economically viable.

3. Language and mathematics

Academic language and literacies and mathematics, when viewed as fields of practice, may seem to be quite divergent. For example, most likely many, if not the majority of language, literacy and numeracy practitioners prefer and indeed, pursue one over the other – not both – while gaining their formal qualifications and subsequently in their teaching; this is definitely the case at our university. Nevertheless, on closer inspection, it can be seen that there are some quite

obvious and other more subtle intersections between these two perhaps often-assumed unrelated branches of learning and we argue that we each employ the other's discipline – often unconsciously – while teaching our own. In fact, it would be extremely difficult to support students in the discipline of mathematics without the use of academic language and it is worth looking at the importance of such language in this context. The language component of mathematics is variously described as the "mathematics register" or "discourse" (Wagner, 2009). Ní Ríordáin (2009, p. 1) suggests that "by developing a student's mathematical register it provides them with analytical, descriptive and problem solving skills within a language and structure so that they can explain a wide range of experiences". Our common aim is to engender confidence and competence in our students to express themselves proficiently both in academic language and academic numeracy.

3.1. Semantics

Just as learning a language requires the learner to acquire competence in its grammar, vocabulary, structures and pronunciation, to achieve learning in mathematics involves gaining these same competences. The symbolic nature of mathematics requires further understanding: often "everyday" language may be used to describe the purpose of each symbol, whereas more "maths specific" language may be required when a student is asked to solve a mathematical problem. Difficulties may arise when there are many terms used to describe one symbol (consider all words which may depict a situation where the simple symbol '+' is required to be used for calculation, for example: 'and', 'more', 'add', 'plus', 'further', 'together', 'sum', 'total' and so on). Further, Zevenbergen (2001, cited by Meiers, 2010) lists words which have one meaning in "everyday" use and another quite different meaning in "maths specific" terms. (A new mathematics learner could surely be forgiven for thinking that they are asked to work in a garden when required to construct a stem-and-leaf plot!)

3.2. Structure

It is also vital for a student to become competent in using the syntax of mathematical language, especially in its symbolic form, as this 'sentence structure' is universally accepted. Students who are unsure of the mathematical language rules will have difficulty in reading and interpreting any literature with even a hint of mathematics content. As well, our primary school student teachers need to teach mathematical concepts to children so numeracy and language are intricately woven together; our student nurses need to calculate drug dosages and read numerical data which they then have to translate to various stakeholders such as colleagues, doctors, patients and patients' relatives; and our finance students need to understand, manipulate and interpret mathematical information to demonstrate the economic health of an organisation. In order to establish their numerical understanding, all students need to explain data in essays and reports; however few students realise that elementary mathematics plays a role in essay writing. Many first-year students in our practice, who access academic literacy consultations, are concerned about the structure and word count of a given written assessment task. They understand broadly the three main components of essay structure: the introduction, body and conclusion, but have little idea how to allocate appropriate amounts to each point in their argument. The simple mathematical technique of estimation enables students to place the difficult task of writing an essay (possibly seen as an insurmountable problem) into a perspective of achievable goals so that first-year students, who do not think they will be able to write 1500 or even 1000 words, can do so with confidence.

3.3. Communication

The importance of communication cannot be overstated. Many of our students struggle to convey their ideas using academic language, both written and spoken, including mathematical language. It is vital that students develop their capacity for effective communication. Obviously this is needed to demonstrate their understanding of course materials while studying in higher education, but it is also essential for participating successfully in their future profession. Further, it is necessary for potential primary school teachers to understand the processes of communication as this understanding gives them an insight into both providing a classroom environment

that is conducive to learning as well as assisting the development of their own students' communication skills. "'Discourse' … is often used as a synonym for 'talking' (the practice of language in any situation) and also to describe the structure and history of mathematics classroom communication" (Wagner, 2009, p. 451). Marr (2000) suggests that "discourse" in the mathematics classroom consists of two parts: "the 'opportunity to speak'" and "the 'means to speak'" (p. 55). Wagner (2009) and Marr (2000) both agree that teachers need to encourage their students to communicate their mathematical ideas. Marr (2000, p. 57) further discusses the positive effect that communication through group investigation and problem solving activities can bring by shifting the "power roles" from teacher to students, where students are no longer simply the "receivers of knowledge".

3.4. Confidence

Thus it is essential that undergraduates who are studying teaching become competent and confident themselves in both the "mathematics register" and "discourse", especially at the Primary Education level. This means that their university lecturers' communication skills need to be used carefully, otherwise there may be a detrimental effect on both the student and the primary school children they will teach in the future. In fact, all facets of their communicative skills must be used carefully, including body language, expression and behaviour. When starting to teach, these students will need to exhibit not only confident knowledge of the content they are teaching, but also to be able to recognise potential difficulties that may arise from the "complexities of language in mathematics" (Meiers, 2010, p. 14).

Of course, the necessity for confidence is not restricted to our future teachers. Nurses will be given the duty of administering medicine to patients and must be confident as well as competent in calculating the correct dosage; their understanding of the mathematics and language involved is paramount. Roles in many other professions necessitate the fluent, proficient use of mathematical knowledge and university graduates must possess this attribute.

4. Learning development

At our university, Learning Development (or ALL) lecturers offer a variety of lectures, seminars, workshops and individual consultations. Individual consultations provide students with focused discussion of their particular issue, whether it is for numeracy or literacy. In both these areas of support we find we encounter similar issues. In this confidential teaching situation, students will often self-identify their low confidence levels, and the advantage of this third space is that students realise that we only grade work in particular circumstances so they are willing to make mistakes, experiment and push the boundaries of their learning, knowing we can facilitate that learning and offer advice and strategies to develop their confidence.

Students enter university with a wide variety of backgrounds, with differing experiences in both numeracy and literacy. Often their backgrounds, especially in mathematics, are not strong, with some students having avoided studying mathematics or chosen not to study it as part of their final secondary school subjects. Other students, although succeeding in mathematics at school, may have been out of education for a while and may perhaps have forgotten 'fundamentals'. Students may encounter mathematics in many different courses in their university studies and many are surprised and possibly distressed by the need to pursue it again. Moreover, students at any level of mathematics or statistics may occasionally – or more often – need help to overcome difficulties in the subject. Thus, there is a great need for assistance in mathematics and statistics-related topics across a range of faculties at university level (MacGillivray & Wilson, 2008; Croft, Harrison, & Robinson, 2009).

Many of our students who enter higher education are organised and motivated but have had little experience with academic literacies although they may have qualifications from other tertiary institutions such as Technical and Further Education (TAFE) colleges. Some imagine that the writing required at university will be the same as they have been producing at secondary school without understanding the different contexts. As with students who will have to study mathematics, as noted above, those who will need to use academic language are often unfamiliar with

the expectations and standards required, often have a fear of failure, and discount the fact they already possess traits and skills that will contribute to their success; we each build on that foundation.

It is apparent that many students who seek support in mathematics have little confidence in their ability in the subject. This lack of confidence may affect their potential to succeed in their mathematics course and therefore, in the long term, their university degree. It is also important that students identify weaknesses and seek to correct them. Students may present with a variety of reasons for seeking assistance. Their diverse backgrounds, learning styles and strategies, as well as their attitudes towards mathematics will vary as will their need to pursue advice. For each of these students, as MacGillivray and Wilson (2008, p. E13) comment, "the focus of learning support tends to be on building mathematical fitness, confidence and transferability, all with reference to the specific course being taken by the students".

We both find a student's level of confidence can be low, or affected for a variety of reasons: it could be that they feel overwhelmed with the amount of work needed in their study; they may be unfamiliar with the particular topic being covered; perhaps they do not understand a concept and have never previously experienced this sense of not understanding. Some students may feel shame in needing to seek assistance and perhaps may even not come forward because of embarrassment as for many, "seeking help is associated with failure or loss of face" (Clegg, Bradley, & Smith, 2006, p. 111). Perhaps students who are required to study mathematics did not enjoy it at school and have set up a barrier towards learning it again; perhaps their background is not strong because of various gaps in their schooling; and in the area of numeracy they may have experienced poor quality teaching in their previous education which has turned them against it; or as one student put it simply: "some people are good at things, some are not".

Students may take very differing amounts of time for both numeracy and literacy support to be effective. Several students use their consultations as 'one-off's' to iron out a lingering problem they have not been able to solve through 'normal channels' (lecturer, tutor, fellow students, for example); others attend for the full semester or continue throughout their course. In fact, many students use our consultations as a regular part of their study routine. It is absolutely necessary to distinguish between those who use the service more as a crutch and those who are in genuine need of support, however, and to try to encourage all to become efficient, successful, independent learners.

5. Case study: Application of initial activities

There is an argument that diverse student enrolment brings with it a lowering of standards and the incapacity of students to be successful in higher education, however, evidence suggests that students do not lack motivation or intelligence, but rather are unable to decode the expectations of universities, faculties and disciplines with confidence (Haggis, 2006). A recent study by McKay and Devlin (2014) reiterates the importance of demystifying academic culture for students. As a result of reflecting on the academic literacy and language practice at our regional campuses (Stirling & Rossetto, 2007) and supported by the literature on the efficacy of timely development of academic literacy, the *Successful Transitions* program was designed and piloted in 2010, and implemented in 2011.

This program was designed explicitly to familiarise and decode the academic literacy expectations for new enrolling students on rural and remote campuses with an emphasis on building their confidence. By 2012, it was realised that there was a need to incorporate a numeracy strand as well because some degree programs contained subjects that relied on mathematics knowledge. By 2013, the numeracy strand had become part of the embedded practice. The three-tiered program extends over students' first semester at university, enabling them to develop their academic capacities in a supportive environment; we focus in this paper on the first and second tiers. At Enrolment Day, new enrolling students are actively encouraged by campus managers to attend the program's first tier called 'Immersion Day' prior to the commencement of the teaching semester. On this day, students are guided through a workbook containing a series of carefully selected activities to familiarise them with processes they will need when they commence

classes. The activities are designed to be inclusive and enjoyable which also begins the process of creating a learning community. These activities include decoding subject outlines; managing edocuments; the netiquette of emailing; dealing with note-taking for lectures; discussing issues of plagiarism; and where to find the different referencing styles required by each school. Students also participate in a group problem-solving session and identify and discuss their attitudes towards mathematics. The problem-solving activity was especially designed to demonstrate to students that they have mathematical ability in spite of a possible lack of confidence in using it. The day employs more senior students to assist with activities and to be available to answer questions that enrolling students may be reluctant to ask of academic staff (Grayson, Miller, & Clarke, 1998). In 2015, negotiations have been in progress to implement the Immersion Day for the Faculty of Business in 2016 at the central campus.

The second tier of the program offers a range of co-curricular seminars over a nine-week period to guide students through the assessment tasks in each subject. The program culminates in another day-long series of scaffolded activities that build critical reading, thinking and writing capacities, which offers students a chance to continue to build their confidence in what and how they are learning. The second semester, 2015, will see the introduction of the seminar series in the School of Nursing at the central campus. To date the mathematics stream offers some course-specific workshops such as *Algebra for Finance students*, developed in collaboration with the course lecturers, which seek to build students' confidence in using mathematics skills they may not have used since high school – or may not have studied at all, in some instances. This method parallels the 'networked' and 'embedded' language and literacy workshops offered by ALL lecturers who work on the central campus collaboratively with subject co-ordinators. The mathematics workshops are designed with the aim of demonstrating the relevance of the mathematics concepts to the course the students are pursuing and the workshops use a variety of engaging activities to explain the mathematical theory. Further learning advice is offered to students through individual or small-group consultations by part-time mathematics lecturers at the regional campuses.

6. Discussion

The *Successful Transitions* program, which continues to evolve, explicitly familiarises and decodes the academic expectations for new enrolling students on rural and remote campuses, the majority of whom are from equity groups, such as low socio-economic backgrounds, 'first in family', mature-age and so on. More often than not, what these students have in common is that their confidence level in their numeracy and/or literacy abilities is low at the commencement of their degree and we have found it is crucial to support students to build their confidence in these areas. We have had to work together and clearly define our focus especially as some faculty academics have misunderstood our aim of building confidence by starting with what students already know and can use to familiarise themselves with university expectations. The Immersion Day activities, which are basic, could possibly be perceived as 'dumbing it down'; however, as Haggis (2006, pp. 524-525) concludes, as a result of the greater diversity in the student population, where many are first in family to attend university, explicit instruction needs to be given and opportunities allowed for academic growth to encourage students to be independent learners. Without this explicit articulation, students can be apprehensive and unsure of how they should proceed, or indeed, if they should continue in higher education. We argue that this program begins to build confidence in both spheres of literacy and numeracy which is crucial for students' success and students' evaluations of the program confirm this (Stirling & Rossetto, 2011, 2012).

There is a distinct difference between 'dumbing it down' and commencing at a level where many students are likely to be and bringing them up to a required standard. In fact, some lecturers in undergraduate programs may assume students have a similar proficiency at the start of their study as they themselves did. Krantz (1993, cited in Latterell, 2007, p. 66) notes that this assumption implies students have more knowledge than they have in reality, which could result in "pedagogical difficulties". It is important that challenges are small and non-threatening for students until students feel comfortable (Kolb & Kolb, 2005) and we have noted they readily

engage in the activities of the first tier of the program and their evaluations note a decrease in their stress level and an increase in confidence. We argue against the criticism of oversimplification as we have seen students disengage when overwhelmed at this initial stage. Therefore, if we scaffold activities, beginning with one designed to be enjoyable and completed in a group with some small reward, students have demonstrated a willingness to engage more readily in difficult aspects. The first tier of our program is designed to build confidence and enthusiasm for the coming semester, not to begin the teaching and learning of knowledge acquisition in specific subjects. It begins to establish a collaborative learning environment and demonstrate to students that while some parts of their proposed study may feel uncomfortable initially, practical support from staff, both academic and administrative, and from fellow students is available and they are encouraged to seek suitable support in good time. Moreover, it is possible in this situation to begin developing social capital, which is important for students' ongoing networks when "bonding, bridging and linking ties" (Black & Yasukawa, 2010, p. 45) may be formed. Reflection on their attitudes is also an important step in becoming self-directed learners, but, as well, being able to discuss these attitudes within a comfortable group forum is beneficial as they realise that there are others who share their feelings (Taylor & Galligan, 2006, p. 23). Although Phyllis Whitin (2007, p. 426) is actually discussing children's attitudes toward mathematics when she argues "[w]hat students believe about mathematics influences what they are willing to say publicly, what questions they are likely to pose, what risks they are willing to take, and what connections they make to their lives outside the classroom", the same can be said for adult learners. Students are then gradually able to take responsibility for their learning as they begin to understand what the expectations are and what processes they need to employ to achieve success.

7. Conclusion

This paper begins the conversation of how our collaboration revealed many intersections and complementary values in our individual practices which we had previously thought were quite distinct and separate. Confidence plays a crucial role in learning, and, for our new enrolling students, access to extra academic numeracy and academic language programs ameliorates the feelings of inadequacy, anxiety and the fear of failure related to their learning journey. We found our experience of negotiating teaching practices for the *Successful Transitions* program offered us an opportunity to exchange ideas, especially about instilling confidence in students, by together examining *what* and *how* we teach. Without this crucial discussion about the aim of instilling confidence, misinterpretation and misunderstandings about the focus, by those not directly involved in the discussion, can occur and the program may be unintentionally undermined. We have explained in this paper how, although at first appearance, academic language and literacy practices seem to differ greatly from their numeracy equivalents, our shared aim to improve and strengthen our students' confidence as well as competence in both areas is felt to be our main priority. By collaboratively teaching, we found there was much to learn from each other which gave both of *us* more confidence when dealing with the other's area of expertise. It provided insight and awareness of how much numeracy is a part of language teaching and *vice versa*. More tellingly, the language specialist gained a more positive attitude towards mathematics that has enabled her to encourage students to be more confident in dealing with numeracy issues. Collaborative teaching gave us the opportunity for professional development, especially to become more confident team players rather than existing in isolation. We have also shown that, although *numeracy* is difficult to define exactly, there is still an important relationship and significant overlap between the fields of academic language and literacy and numeracy themselves. Literature which focuses on learning, as well as our own experience teaching in higher education whether it be from a numeracy or a language perspective, suggests our practices have much in common and instead of existing in parallel universes they lie in Venn intersecting circles.

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